



# KAIZEN ENVIRO-NEWS

## What's Happening In Kaizen

Mr. Navin Persad is currently conducting Training in The State Oil Company (Staatsolie), in Suriname.

Appointment of a new Lab Supervisor, Mrs. Cindy Dass-Lall.

## THE PRESIDENT SPEAKS

It gives me great pleasure to introduce the Analytical Services Division of KESTL to you our environmental partners. KAIZEN Lab (1997) was the first private commercial environmental laboratory established in Trinidad. Today, the KAIZEN Lab has a client base throughout the petroleum, petrochemical and manufacturing industries of Trinidad and Tobago and has also executed project works in Surinam, Guyana and several other Caribbean countries.

*The Kaizen Analytical Services Division management team, led by Dr. Derek Balladin, continues to challenge the boundaries of quality analytical services and build its' analytical skill sets through a commitment to excellence, personnel development and technology optimization.*

I invite you to contact Dr. Balladin and our team of analytical experts at the KAIZEN Lab to support your efforts towards acquiring analytical answers and creating environmental solutions.

## ANALYTICAL DIVISION MANAGER/ PROJECT CHIEF

*Dr. Derek Balladin, PhD – Manager, Analytical Services Division*



Dr. Balladin has a Doctorate degree in Analytical Chemistry from the University of the West Indies, St Augustine Campus (1995) and a Masters degree in Chemical Engineering/Analytical Chemistry from University of the West Indies, St Augustine Campus, Trinidad W.I.

He has the privilege to carry the prestigious designations of CChem (Chartered Chemist) and CSci (Chartered Scientist) from the Royal Chemistry Society of which he is a member (MRSC).

Dr. Balladin has published numerous papers in international journals on Enzyme Application, Development of Biosensors, Extraction and Evaluation of Natural Products, Solar Energy and its application (Post- Doctoral studies) and in the area of Chemometrics.

Dr. Balladin has lectured extensively to under-graduate chemistry students in Analytical Chemistry and Organic, Physical and Inorganic Chemistry. At the Post-graduate level, he lectured Toxicology and the Measuring and Monitoring courses. He was very pivotal in the foundational work required for the Accreditation of the Analytical Chemistry, Microbiology and Toxicology Laboratories.

Dr. Balladin has extensive training in Estimating Uncertainties for Chemical Analysis{NIST,USA}; Laboratory Quality Management and Effective Internal Auditing of Laboratories { LabQual Training Services, UK} and Smithsonian Institute Environmental Leadership.

At Kaizen Environmental Services (Trinidad) Ltd., Dr. Balladin supervises the operations in the laboratory at Pointe-a- Pierre and provides technical support to the other three Divisions. He is responsible for the development of new analytical procedures and documenting methodology at both the field and bench level. Dr. Balladin implements and manages the quality control and quality assurance of all field analytical data, the calibration stability for all analytical testing instruments, and the ongoing training and quality assurance associated with all Laboratory technicians.

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## ANALYTICAL SERVICES DIVISION

In keeping with the corporate motto of “*Continuous Improvement Towards Total Quality*” the Analytical Services Division has adopted the specific mission of striving to ensure that accurate results are delivered to the clients in a timely manner using procedures that protect the environment, the health and safety of employees and all stakeholders.

**All Staff Members of Kaizen Environmental Services (Trinidad) Limited- Analytical Services Division are charged with:**

- Providing accountability for the Quality and Integrity of the Division’s services. These services require that proper documentation of the pertinent laboratory functions and the data produced are accurate.
- Striving to maintain and improve their technical knowledge and professional competence.
- Maintaining cooperative, professional working relationships with ALL Kaizen Environmental Services Limited employees and Clients.

The Analytical Services Division experienced/qualified personnel offers quality, service and value for money.

### Divisional Strengths

- **Proven Track Record** - Kaizen Lab has been established for 10 years.
- **Cost Management** – Kaizen Lab understands that all clients are faced with the challenges of cost management and partner with all Kaizen clients to deliver cost effective analytical answers and solutions.
- **Superior QA/ QC Program** – CAEAL certified laboratory.
- **Superior Response** – 5-day turnaround time for routine analysis
- **Superior EH&S Program** - Stringent documented health and safety procedures including documented disposal system for samples, reagents, chemicals and effluent.
- **Superior Technical Support.** The company’s entire professional staff including those of the parent company in Canada provides technical backstopping.
- **Superior Customer Service** – Kaizen Lab staff are committed to providing ALL customers both internal and external with the highest quality service in a timely and cost effective manner.

*The Analytical Division is currently pursuing accreditation from the Canadian Association for Environmental Analytical Laboratories (CAEAL) and has received a Certificate of Laboratory Proficiency.*

### Summary:

*Good technical support services (Both Locally & Internationally); Qualified & Trained Technicians; knowledge of the market ;Proactive approach to customer needs ; comprehensive range of services  
Excellent QA/QC Program: 24/7 Accessibility*



*(L-R Clara Gangaram-Lackan, Dhanraj Rampersad, Ria Ramdial, Seated Dr. Derrick Balladin.)*

## MICROTOX Basic Bioassay Overview:

Ecotoxicity testing, also known as bioassay testing, is used to quantify the presence of potentially toxic and inhibitory chemicals within our environment using surrogate organisms other than humans. At present, the art and science of using various surrogate indicators, includes:

- Fish (e.g. *Poecilia reticulata* guppy),
- Mysid shrimp-*Metamysidopsis insularis*
- Worms,
- Bacteria (luminescent bacteria, nitrifying bacteria, mixed heterotrophic bacteria, methanogenic bacteria)

Kaizen wishes to introduce you to one such commercially-available test known as the Microtox test. These types of laboratory tests are used to assess potential problems from existing and new wastewater effluents, to monitor industrial effluents, to assess performance at treatment facilities and more recently for regulatory purposes. The selected ecotoxicity method(s) (whether to use fish, insect, bacteria, etc.) must be sensitive, robust and relevant to specific biological processes. The use of microorganisms, however, allows for more rapid and more reproducible testing.

### Why are luminescent bacteria useful for toxicity testing?

The basic technology of the Microtox Test System is based upon the use of luminescent bacteria, specifically the strain *Vibrio fischeri* NRRL B-11177, to measure toxicity from environmental samples. When properly grown, luminescent bacteria produce light as a by-product of their cellular respiration. Bacterial bioluminescence is tied directly to cell respiration, and any inhibition of cellular activity (toxicity) results in a decreased rate of respiration and a corresponding decrease in the rate of luminescence. The more toxic the sample, the greater the percent light loss from the test suspension of luminescent bacteria.



### Microtox Acute Test System Product Overview :

**Description:** The Microtox Acute Toxicity Test is a 15 minute exposure metabolic inhibition test which uses freeze-dried luminescent bacteria (*Vibrio fischeri* NRRL B-11177) to assess the acute toxicity of water, soil or sediment samples.

**Validation:** The Microtox Acute Test has been validated by the industrial, academic, and governmental testing communities. The current Microtox bibliography contains over 500 papers and reports, pertaining to the use, evaluation and application of the Microtox Acute Test System.

**Standards and Approvals:** The Microtox Acute Test has achieved official "Standards Status" in several countries including an ASTM Standard (D-5660) in the US. The final ISO Draft (11348-3) entitled "Water Quality-Determination of the Inhibitory Effect of Water Samples on the Light Emission of *Vibrio fischeri* (Luminescent Bacteria) Test" has been approved.

The Microtox Acute Test is an approved regulatory test in Alberta, Canada. The test is used to estimate toxicity of oil well drilling sump fluids. This testing application was overseen and approved by the Alberta Energy & Utilities Board.

A special Microtox Acute Test protocol for measuring Whole Effluent Toxicity Testing (WET) has been submitted to the US EPA for approval as a new method for use in the National Pollution and Discharge Elimination System (NPDES).

**Test Sensitivity:** A published database which lists Microtox EC50 values (in mg/l) for over 1,200 chemicals is available. The test chemicals are listed by CAS number and common name.

**Test Precision :** The Microtox Acute Test has been the subject of many reproducibility evaluations including multiple laboratory round robin test evaluations. These published studies (see bibliography) have confirmed coefficient of variation (CV) values averaging about 20% which is similar to chemical analysis methods and much better than other whole organisms bioassays.

**Test Turnaround:** Test data are generally available in about 30 minutes.

**Applications:** The Microtox Acute Test has been successfully used for a variety of environmental, process monitoring and educational applications. The most common environmental applications include:

- Wastewater treatment plant influent testing for protection of activated sludge
- Wastewater treatment plant effluent testing for protection of receiving waters
- Toxicity Reduction Evaluations (TRE's) and Toxicity Identification Evaluations (TIE's)
- Surface water monitoring for identification of point source and non-point source pollution
- Monitoring raw drinking water for contamination due to spills, point source or non-point source pollution, sabotage or terrorist acts
- Sediment testing
- Soil contamination testing and monitoring of remediation processes
- Biocide monitoring of industrial process waters

*Kaizen continues to be in the forefront of applying biosensor based measuring systems for toxicity testing of water, sediment and soil samples.*

*This type of testing sometimes referred to as toxicity bioassay has been in use for many years but has suffered from common deficiencies such as high cost per test, extended time to obtain data and the inherent variability of test data.*

*Microtox bioassay combines the advantages of whole organism toxicity testing and instrument precision to produce a biological test system which possesses beneficial features of instrumental based analysis.*

Strategic Diagnostics Inc, (SDI) headquartered in Newark, DE USA, is a biotechnology company dedicated to bringing innovative solutions to analytical testing problems through immunotechnology. SDI is a leading developer and manufacturer of immunoassay-based test kits for both field testing and laboratory use. These products are used extensively for contaminated site assessment and remediation and water quality management.

SDI is the manufacturer of the Microtox® system, the worldwide standard for rapid and accurate toxicity monitoring. The use of living test organisms is the only way to reliably measure the toxicity of water. Microtox systems combine the advantage of whole-organism toxicity testing with the speed and precision of analytical instruments to provide a reliable test system and rapid results.

Kaizen is the local distributor for SDI and the Microtox® system.

For further information on the Microtox® test system, acquisition, rental or lease please contact Mr. John Thompson or Mr. Fareed Ali of Kaizen's EnviroPRODUCTS Division at 868 658-0088.

**ANNIVERSARIES / BIRTHDAYS FOR THIS MONTH**

Navin Persad - Birthday 20th September  
Clevon Lalsingh- Birthday 22nd September

**Chief Editor:** *D. De Freitas*

**Graphic Artist:** *K. Lucky*

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*L. Keane & D Balladin.*



**Kaizen Environmental Services (Trinidad) Ltd.**

*Continuous Improvement Towards*